

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

RG

12

EUROPEAN PATENT APPLICATION

21 Application number: 85100231.1

61 Int. Cl.⁴: F 16 G 5/16

22 Date of filing: 11.01.85

30 Priority: 24.01.84 NL 8400213

43 Date of publication of application: 14.08.85 Bulletin 85/33 ✓

64 Designated Contracting States:
AT CH DE FR GB IT LI NL SE

71 Applicant: Van Doorne's Transmissie B.V.
Dr. Hub van Doorneweg 120 Postbus 500
NL-5026 RA Tilburg(NL)

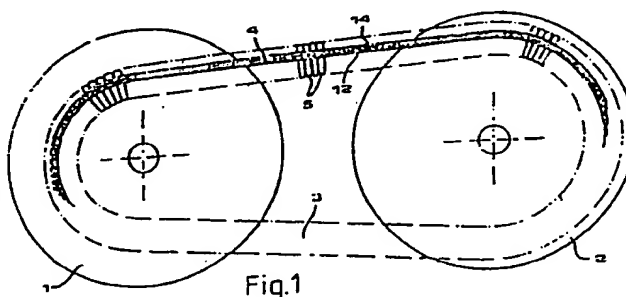
72 Inventor: Cadée, Theodorus Petrus Maria
Pastoor de Beeckstraat 11
NL-5051 TJ Goirle(NL)

72 Inventor: Hendriks, Emerie Frederik Marie
De Zadelmaker 4
NL-5591 NR Heeze(NL)

74 Representative: Timmermans, Anthonius C.Th., Ir.
European Patent Attorney Postbus 188
NL-5530 AD Bladel(NL)

84 Driving belts for use on V-belt pulleys.

87 A driving belt for use on V-belt pulleys, provided with an endless carrier consisting of two packages, each composed of a number of endless striplike bands mounted one round the other, also provided with a number of transverse elements mounted slidably on the carrier which have slots on both sides, each slot being intended for receiving a carrier package and being bounded by a contiguous surface resting against the inside of the package and a contiguous surface acting together with the outside of the package, the latter contiguous surface extending over less than three quarters of the width of the package, in which the contiguous surface is intended to act together with the outside of the package is substantially inclined at such an angle to the lateral axis of the package that the slot substantially tapers slightly inwards.



EP 0 151 396 A2

- / -

Driving belts for use on V-belt pulleys.

The invention relates to a driving belt for use on V-belt
5 pulleys, provided with an endless carrier consisting of two
packages, each composed of a number of endless striplike
bands mounted one round the other, also provided with a num-
ber of transverse elements mounted slidably on the carrier
which have slots on both sides, each slot being intended for
10 receiving a carrier package and being bounded by a contiguous
surface resting against the inside of the package and a con-
tiguous surface acting together with the outside of the pack-
age, the latter contiguous surface extending over less than
three-quarters of the width of the package. ———

15 Such a driving belt is described in U.S. Patent 3 949 621, in
which Fig. 5 shows a schematic cross-section of such a dri-
ving belt with relatively small contiguous surfaces acting
together with the outsides of the packages. Fig. 1 of the
same patent depicts a corresponding cross-section through a
20 driving belt with contiguous surfaces extending over the en-
tire width of the packages.

The concept of limiting the size of that part of the trans-
verse element which is located above the packages fits in with
the effort to make the transverse element lighter by reduc-
25 tion of the surface area. In principle, such a transverse
element allows a higher speed of the driving belt and gene-
rally results in a better performance of the driving belt. In
actual practice, however, it has been found that a driving
belt as represented in Fig.5 of the said United States patent
30 fails to comply with the requirements, because the mutual in-
teraction between the transverse element and the packages of
the carrier proves to be inadequate, which may give rise to,
for instance, premature wear.

An object of the present invention is to provide a driving belt in which the dimensions of that part of the transverse element which is located above the packages are limited, whilst an optimum interaction between the carrier and the 5 transverse elements is ensured.

According to the invention, the contiguous surface intended to act together with the outside of the package is substantially inclined at such an angle to the lateral axis of the package that the slot in which the package is positioned 10 substantially tapers slightly inwards.

Although it could be imagined that the use of a slightly tapering slot would constitute a disadvantage because of the package tending to run off the slot, actual practice has shown that this very arrangement has an advantageous effect 15 on the operation of the driving belt.

According to a further feature of the invention, the angle under ~~which~~ the contiguous surface intended to operate jointly with the outside of the package is inclined to the lateral axis of the package, is on average substantially between 2° 20 and 5°.

According to still another feature of the invention, the contiguous surface intended to operate jointly with the outside of the package may be convexly curved in the lateral sense relative to the driving belt. Such a convexity will preferably 25 ably have a radius of curvature between 50 and 1000 mm.

If the contiguous surface intended to operate jointly with the outside of the package is not plane but curved, it is obviously a question of an average surface making an angle with the lateral axis of the package.

30 A convex curvature may have a centre, i.e. an imaginary point in the centre of a circle, part of whose circumference coincides with the curvature. Conceivably, however, the cur-

vature may not exactly have the form of an arc, so that in fact there are several centres generally situated in an area that can, as a whole, be designated as the centre.

According to yet another feature of the invention, the centre
5 of the curvature may lie on the other side of the plane of radial symmetry through the driving belt than the convexly curved contiguous surface intended to operate jointly with the outside of the package, as will be explained in more detail with reference to the drawing.

- 10 To elucidate the invention, two embodiments will now be described by way of example with reference to the accompanying drawings, in which
Fig. 1 is a simplified diagram of a driving belt looped round two pulleys;
15 Fig. 2 is a diagrammatic cross-section through a driving belt of the first example;
Fig. 3 is a side view of a transverse element of the first example; and
Fig. 4 depicts a transverse element of a driving belt of a
20 second example.

Fig. 1 represents two pulleys 1, 2 and, by means of a dot-dash line, the driving belt 3 looped round them. This driving belt 3 is provided with a carrier 4 and a number of transverse elements 5 which have been slidably mounted on the carrier 4 in an uninterrupted series and which may come into
25 contact with the pulleys 1, 2.

Fig 2 depicts a cross-section through the driving belt 3, that is, through the two belt packages, briefly called packages 10, which constitute the carrier 4 in a front view of
30 transverse element 5. According to the figure, each package 10 consists of four endless bands mounted one round the other. In actual practice, the design may comprise more bands, for instance, ten endless metal bands fitted one round the other with a thickness of, say, 0,2 mm each.

The transverse element according to the example of Fig. 2, of which a side view is represented in Fig. 3, has a tapering section 6 which changes at the location of the tilting edge or contact area 7 into a section 8 whose main faces are
5 parallel and which is located above the packages 10. The two packages 10 are positioned in slots 9, each of which is bounded by a contiguous surface 11 fitting the inside (indicated with reference numeral 12 in Fig. 1) of package 10 and a contiguous surface 13 operating jointly with the outside
10 (indicated with reference numeral 14 in Fig 1) of package 10.

As appears from Fig.2, the bottom surface of the transverse element has a concavity 15 in order to make the transverse element lighter. With the same end in view the section 8 of the transverse element which is located above the packages 10
15 has been made of such limited size that it covers less than three quarters of the width of package 10.

As represented in Fig.2, the contiguous surface 13 is disposed at ~~an angle~~ α to the lateral axis of the package. In general, the contiguous surface 13 will not be perfectly
20 plane, but may exhibit a circular or non-circular curvature in both directions, in which case the average angle is equal to α .

According to a second embodiment, of which a transverse element is represented in Fig. 4, the contiguous surface 13 has
25 a convex curvature in crosswise direction relative to the driving belt. This curvature is denoted by radius R, which does not otherwise need to be constant throughout the entire contiguous surface 13.

According to Fig. 4 the average curvature of the contiguous
30 surface 13, which is denoted by radius of curvature R, has its centre at a position 16 situated on the other side of the plane of radial symmetry 17 of the said contiguous surface 13. As appears from Fig. 4, this arrangement results in a substantially tapering slot 9 which in actual practice has shown

an excellent performance. Such a curvature of the contiguous surface 13 can be brought about during the punching of the transverse element or may, for instance, be ground in.

As a point of interest, it is to be observed that the reference numerals used in Fig. 4 are the same as those of Fig. 2.

Claims

1. A driving belt for use on V-belt pulleys, provided with an endless carrier consisting of two packages, each composed of a number of endless striplike bands mounted one round the other, also provided with a number of transverse elements mounted slidably on the carrier which have slots on both sides, each slot being intended for receiving a carrier package and being bounded by a contiguous surface resting against the inside of the package and a contiguous surface acting together with the outside of the package, the latter contiguous surface extending over less than three quarters of the width of the package, characterized in that the contiguous surface intended to act together with the outside of the package is substantially inclined at such an angle to the lateral axis of the package that the slot substantially tapers slightly inwards.
2. A driving belt according to claim 1, characterized in that the angle, under which the contiguous surface intended to act together with the outside of the package is inclined to the lateral axis of the package, is on average substantially between 2° and 5° .
3. A driving belt according to either one of claims 1 and 2, characterized in that the contiguous surface intended to act together with the outside of the package is convexly curved in the lateral sense relative to the driving belt.
4. A driving belt according to claim 3, characterized in that the curvature of the contiguous surface intended to act together with the outside of the package has a radius between 50 and 1000 mm.
5. A driving belt according to claim 3, characterized in that the radius of curvature is between 100 and 300 mm.
6. A driving belt according to any one of claims 3 - 5, characterized in that the centre of the curvature lies on

the other side of the plane of radial symmetry through the driving belt than the convexly curved contiguous surface intended to act together with the outside of the package.

